REMARKS

Favorable reconsideration of this application, in light of the following discussion and in view of the present amendment, is respectfully requested.

Claims 31 and 71 are amended. Claims 1-93 are pending in the application.

I.   Claim Objections

In the Office Action, at page 2, claims 31 and 71 were objected to as being of improper dependent form and because of informalities, respectfully. In view of the Examiner's comments, claims 31 and 71 were amended, and accordingly, withdrawal of the claim objections is respectfully requested.

II.   Rejection under 35 U.S.C. § 101

In the Office Action, at page 2, claims 63-93 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. This rejection is respectfully traversed.

First, claims 63-93 specifically recite "a computer readable storage medium controlling a computer." It is a "bedrock principle" of patent law that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." Innova, 381 F.3d at 1115; see also Vitronics, 90 F.3d at 1582 ("we look to the words of the claims themselves...to define the scope of the patented invention"); Markman F.3d at 980 ("The written description part of the specification itself does not delimit the right to exclude. That is the function and purpose of the claims."). As has been well established in numerous published patents, a computer readable storage medium that controls a computer to execute a process constitutes statutory subject matter. As long as the computer readable storage medium stores a program that causes a manmade object, such as a computer, to execute operations, then the claimed subject matter is not non-statutory subject matter.

Further, the Supreme Court has interpreted the term "manufacture" in accordance with its dictionary definition to mean 'the production of articles for use from raw or prepared materials by giving these materials new forms, qualities, properties or combinations, whether by hand-labor or machinery.'" Diamond V. Chakrabarty, 447 U.S. 303, 308 (1980)(Quoting Am. Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11 (1931)). As the Chakrabarty Court observed, the "expansive" scope of the term "manufacture" reflects Congress's intent that patentable subject matter "include[s] anything under the sun that is made by man." Id. at 308-09 (quoting S. Rep No. 82-2979 at 5 (1952); H.R. Rep No. 82-1923 at 6 (1952)).

This broad definition of manufacture encompasses electrical signals, which are things made by man. In the electrical arts, a machine, such as a computer produces a signal using electricity (*i.e.* electrons) to carry information. See Harry Newton, Newton's Telecom Dictionary 622 (17th Ed. 2001)(explaining that a signal may be "[a]n electrical wave used to convey information"). The machine transforms the signal into a useful carrier of information by encoding the signal with data through any of a plethora of techniques. Thus, the creation of an electrical signal meets the *Chakrabarty* Court's definition of manufacture: producing a signal from electricity (*i.e.*, electrons) by giving the electricity new forms, qualities and properties through the data encoding process, where the production occurs by a machine. See *Diamond V. Chakrabarty*, 447 U.S. at 308; see also Dolbear v. Am. Bell Tel. Co., 126 U.S. 1, 533-35 (1888) (holding that claims to the use of electricity to carry vocal sounds – *i.e.*, information – were patentable).

Additionally, in Appeal No. 2,002-1554 in the case of Ex parte Rice (Application 08/003,996) the BPAI reversed an examiner's rejection of signal claims as being directed to non-statutory subject matter under 35 U.S.C. § 101, holding that electromagnetic signals, although "transitory and ephemeral in nature," are statutory subject matter.

Therefore, withdrawal of the § 101 rejection is respectfully requested.

III.   Rejection under 35 U.S.C. § 102

In the Office Action, at page 3, claims 1-93 were rejected under 35 U.S.C. § 102(b) as being unpatentable over European Patent No. 0 768 774. This rejection is respectfully traversed because EP '774 does not discuss or suggest:

> generating an N-th layer key;
>
> generating an (N+1)-th layer key by applying the N-th layer key to a predetermined function;
>
> encrypting N-th layer data using the N-th layer key; and
>
> encrypting (N+1)-th layer data using the (N+1)-th layer key,

as recited in independent claims 1, 32 and 63.

EP '774 further does not discuss or suggest:

> generating an N-th layer key;
>
> generating an (N+1)-th layer key by applying the N-th layer key to a predetermined function;
>
> decrypting encrypted N-th layer data using the N-th layer key; and
>
> decrypting encrypted (N+1)-th layer data using the (N+1)-th layer

key,

as recited in independent claims 18, 49 and 80.

EP '774 also does not discuss or suggest:

> generating an N-th layer key, generating an (N+1)-th layer key by applying the generated N-th layer key to a predetermined function, encrypting N-th layer data using the N-th layer key, and encrypting (N+1)-th layer data using the generated (N+1)-th layer key; and

> generating the N-th layer key, generating the (N+1)-th layer key by applying the N-th layer key to the predetermined function, decrypting the encrypted N-th layer data using the N-th layer key, and decrypting the encrypted (N+1)-th layer data using the (N+1)-th layer key,

as recited in independent claims 27, 58 and 89.

As a non-limiting example, the present invention of claim 18, for example, is directed to an apparatus to hierarchically decrypt media data structured in hierarchical layers. The apparatus includes an N-th layer key generator that generates an N-th layer key, and an (N+1)-th layer key generator that generates an (N+1)-th layer key by applying the N-th layer key to a predetermined function. The apparatus further includes an encrypted N-th layer data decryptor that decrypts the encrypted N-th layer data using the N-th layer key, and an encrypted (N+1)-th layer data decryptor that decrypts encrypted (N+1)-th layer data using the (N+1)-th layer key.

EP '774 discusses a method and apparatus for data encryption using a key generation hierarchy. In EP '774, encryption keys are hierarchized. For example, an encryption key K1 of the next hierarchy (Ver.n) is formed relative to an encryption key of the first hierarchy (master key) K0 by using a one-way function F, which carries out an irreversible calculation in which the encryption key K1 can be easily calculated from the encryption key K0 but the reverse calculation cannot be performed (i.e., K0 from K1). Function F(k) in EP '774 is a "remainder which results from dividing product multiplied with k by p." After the encryption key K1 is obtained from the master key by using the one-way function (F), encryption keys K2, K3...Kn-1, Kn are sequentially calculated by using the one-way function (F), using the equation ki=F(Ki-1), where I=1, 2, 3...n and the numerical value n is the sufficient number of hierarchies (number of generations). The encryption key Kn of the lowest hierarchy initially distributed is calculated from the encryption key Kn-1 of the next hierarchy by using the function (F). EP '774 does discuss that the information, such as moving image, sounds, data or software, can be encrypted.

However, while EP '774 discusses that a key of a next hierarchy is generated based off a key of a lower hierarchy, EP '774 does not discuss or suggest that N-th layer <u>data</u> and (N+1)-th layer data are encrypted with an N-th layer and (N+1)-th layer key, respectively, where the layers involved are <u>hierarchical layers of media data</u>. Merely providing keys of next hierarchies does not suggest that <u>layers of data</u> are encrypted with the keys, where each key generated is used to encrypt a different layer of data. EP '774 does not suggest that N-th layer data or (N+1)-th layer data are each encrypted with different keys, where the (N+1)-th layer key is generated from the N-th layer key. EP '774 discusses encrypting data using keys generated from keys of lower hierarchies, but EP '774 does not discuss or suggest encrypting different <u>layers</u> of media <u>data</u>, each layer being encrypted with a different key, where a second key is generated from a first key.

In contrast, the present invention of claim 1, for example, is directed to an apparatus and method of encrypting media data, where the layers involved are <u>media data layers</u>. Therefore, for example, a lowest layer of media data is an entire video data, except for key clip and key frame data, and a higher layer of media data is key clip data, except the key frame data. The hierarchical layers discussed in EP '774 are merely numbers of generations of encryption. The hierarchical layers of the present invention of claim 1, for example, are layers of media data. Thus, the N-th layer and (N+1)-th layer keys are keys used to encrypt <u>N-th layer</u> data and <u>(N+1)-th layer</u> data. EP '774 does not suggest that the generations of keys are each used to encrypt different data layers. EP '774 merely discusses that different generations of keys are generated from lower generations using an irreversible function (F).

Therefore, as EP '774 does not discuss or suggest "encrypting N-th layer data using the N-th layer key; and encrypting (N+1)-th layer data using the (N+1)-th layer key," as recited in independent claims 1, 32 and 63, EP '774 does not discuss or suggest "decrypting encrypted N-th layer data using the N-th layer key; and decrypting encrypted (N+1)-th layer data using the (N+1)-th layer key," as recited in independent claims 18, 49 and 80, and EP '774 does not discuss or suggest "encrypting N-th layer data using the N-th layer key, and encrypting (N+1)-th layer data using the generated (N+1)-th layer key; and...decrypting the encrypted N-th layer data using the N-th layer key, and decrypting the encrypted (N+1)-th layer data using the (N+1)-th layer key," as recited in independent claims 27, 58 and 89, claims 1, 18, 27, 32, 49, 58, 63, 80 and 89 patentably distinguish over the reference relied upon. Accordingly, withdrawal of the § 102(b) rejection is respectfully requested.

Claims 2-17, 19-26, 28-31, 33-48, 50-57, 59-62, 64-79, 81-89 and 90-93 depend either directly or indirectly from independent claims 1, 18, 27, 32, 49, 58, 63, 80 and 89 and include all the features of their respective independent claims, plus additional features that are not discussed or suggested by the reference relied upon. For example, claim 3 recites that "the N-th layer data is the entire media data except key clip data and key frame data, and the (N+1)-th layer data is the key clip data except the key frame data." Therefore, claims 1-17, 19-26, 28-31, 33-48, 50-57, 59-62, 64-79, 81-89 and 90-93 patentably distinguish over the reference relied upon. Accordingly, withdrawal of the § 102(b) rejection is respectfully requested.

Conclusion

In accordance with the foregoing, claims 31 and 71 have been amended. Claims 1-93 are pending and under consideration.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

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